

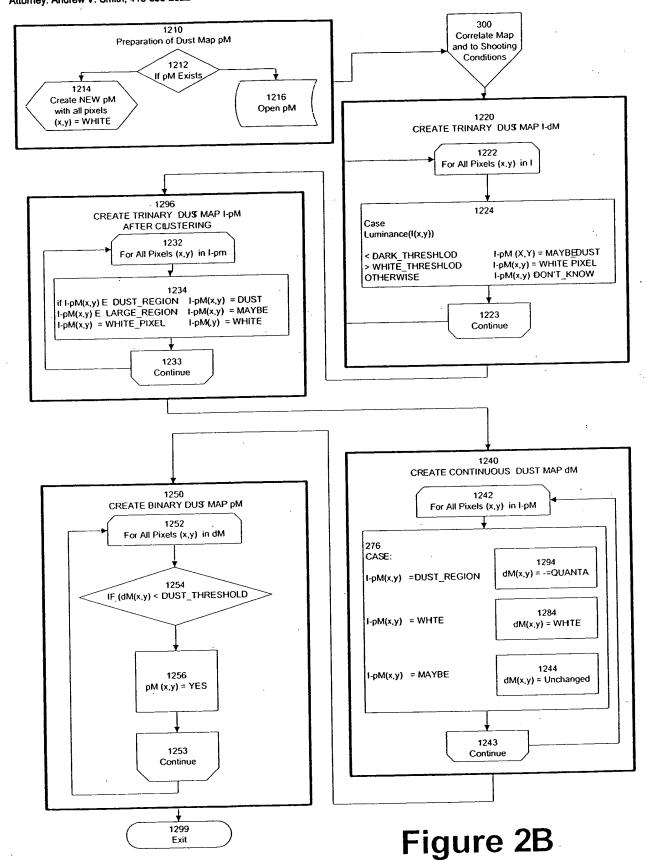
Express Mail: EV330728586US Attorney Docket: 2100874-991340 For: Determination of Need to Service a Camera Based on Detection..., filed September 30, 2003 Inventors: Eran Steinberg, et al., Page 2 of 22 Attorney: Andrew V. Smith, 415-836-2522 240 220 If function called If number of images is ith a single image more than hdp MULTPLE IMAGES 230 Sample Images in a sequence to 250 create an image Schedule = number of images schedule 260 For each Image (I) in the schedule 300 SINGLEIMAGE Correlate Map and to Shooting Conditions 270 If all dust regions have p(Hdp) and all non dust regions have p(Ndp) and all image is covered NOT YET 292 282 Mark regions with Mark regions 296 271 potentially dust high probability as Cluster Dust Pixels Continue non dust (ND) (YD) into Dust Specs 294 Add dust regions Add non-dust to the map based regions to the map based on f(ndp) on f(hdp) Continue loop for each image 273 Continue YES 272 Alternative 296 Cluster Dust Pixels into Dust Specs 500 Perform Quality

Control of Dust
Map

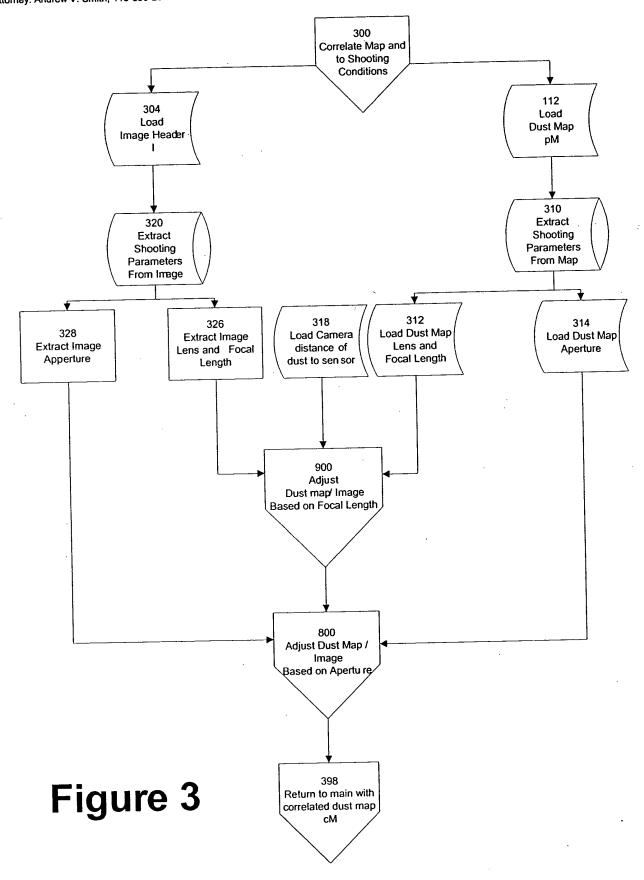
298
Exit and return in case
of a single image

Figure 2A

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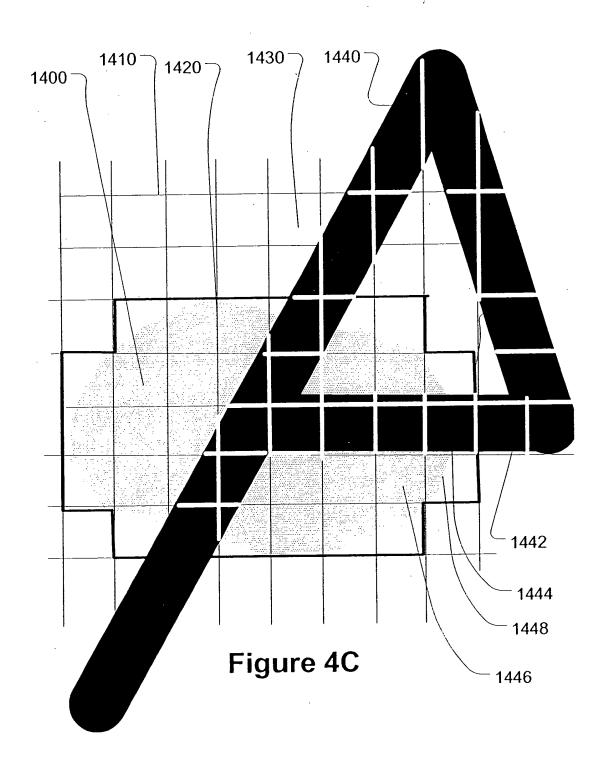
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For: Determination of Need to Service a Camera Based on Detection..., filed September 30, 2003 Inventors: Eran Steinberg, et al., Page 5 of 22 Attorney: Andrew V. Smith, 415-836-2522 400 402 Detect and 404 Load Remove Dust Load **Dust Map** spec Image сМ 410 For Each Dust Spec in cM 500 Perform Quality Control for a 420 single Pixel For Each Pixel where OPACITY < FULL 432 430 I'(x,y) = I(x,y)/Enhance image **OPACITY** degradation Continue loop for each Continue **Dust Spec** 451 440 For region area where Opacity = FULL (O(x,y))End of aperture correction 450 In-Painting econstruction, 500 Perform Quality Control for a single Pixel Figure 4A

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where Opacity = FULL (O(x,y))460 For each pixel (I,j) in the periphery of O(x,y)For each pixel (I,j) in O(x,y) 462 Define the Gradient for (i,j) 482 Apply a new value based on its surrounding pixels 470 For each pixel (k,l) in the Inner boundaries of O(x,y) 489 Continue 472 Find the pixel (m,n) surrounding (k,l) with the smallest Gradient 474 Apply I(k,l) =L2||(m,n),(k,l)||*Grad(I(k,l)) 476 Remove (k,I) from O(x,y) Figure 4B 479 Continue

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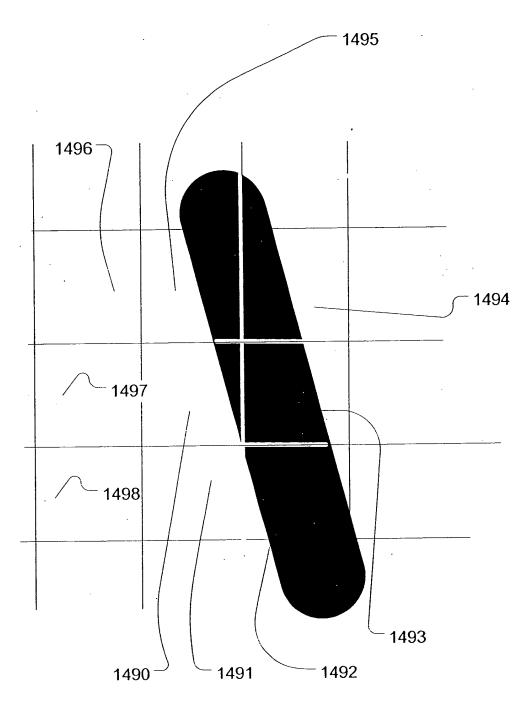


Figure 4D

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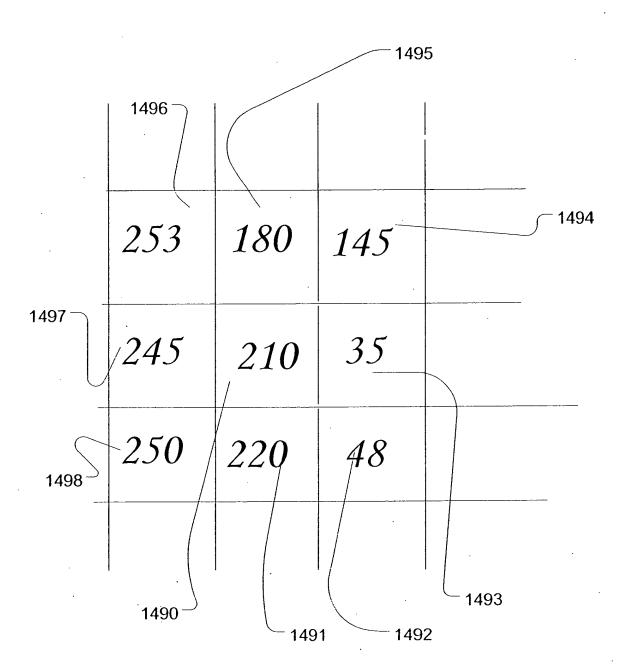


Figure 4E

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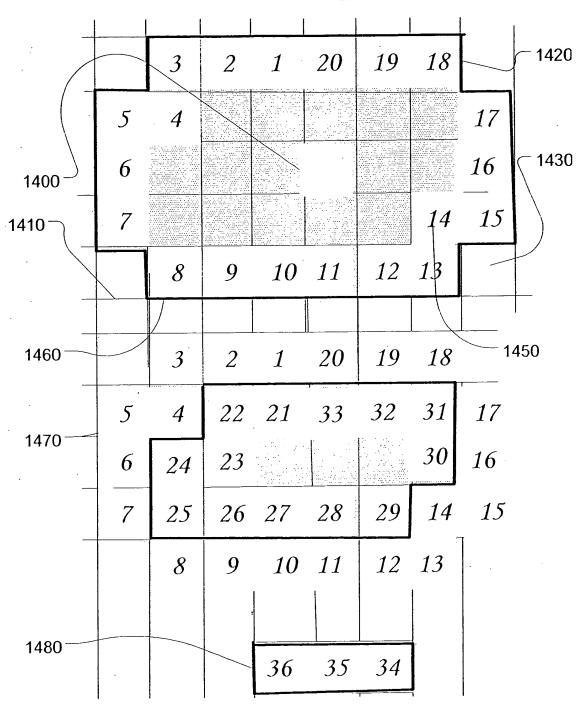


Figure 4F

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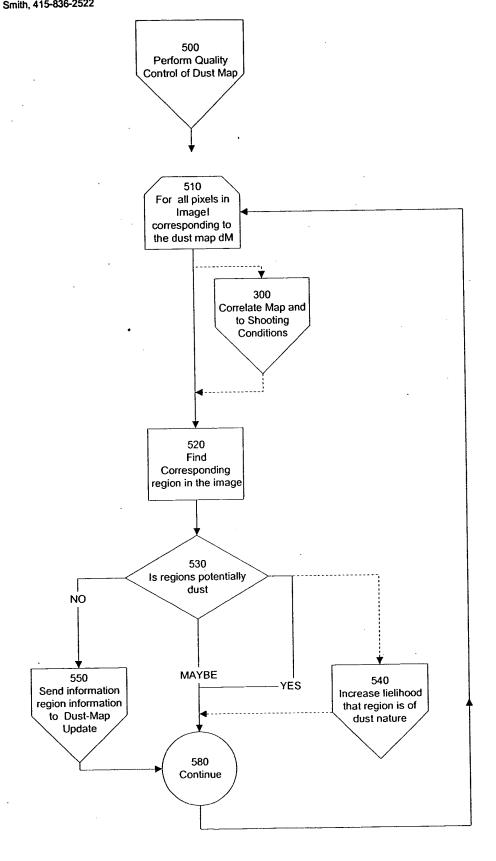
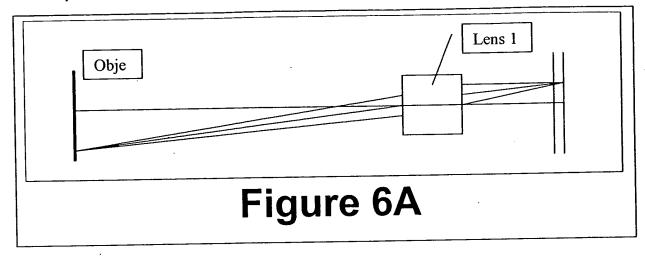
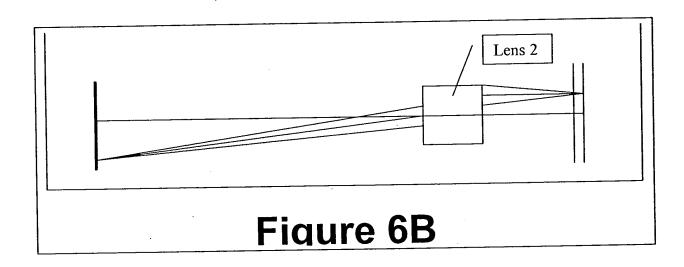
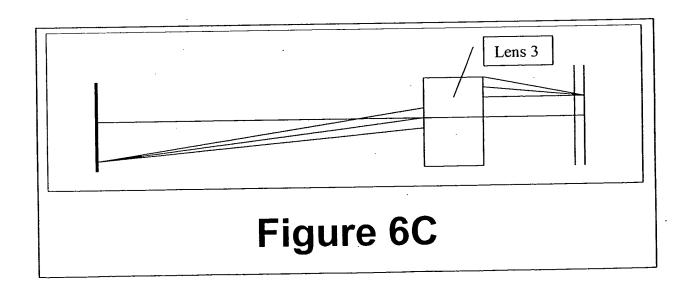


Figure 5

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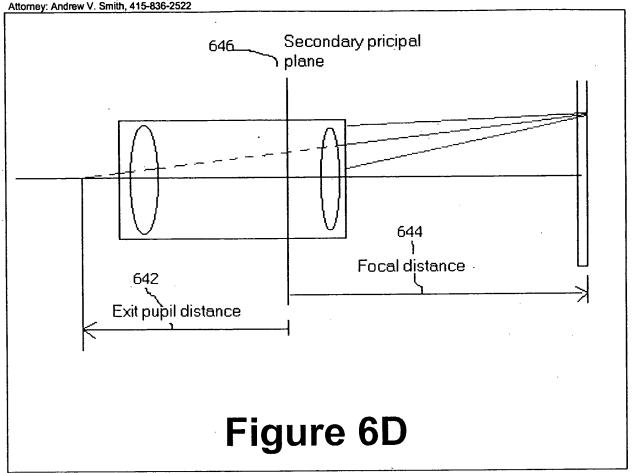


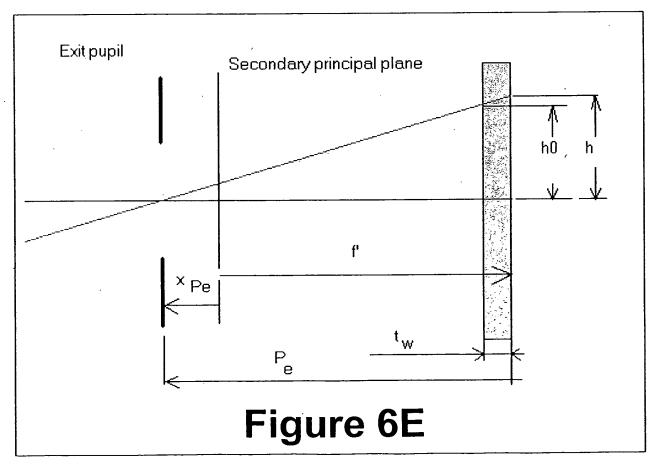




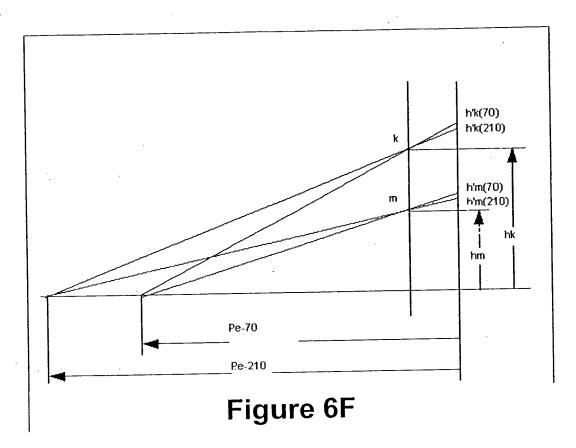
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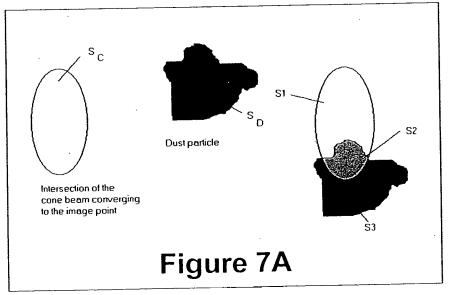
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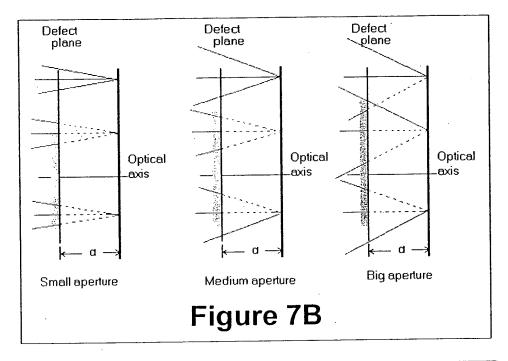


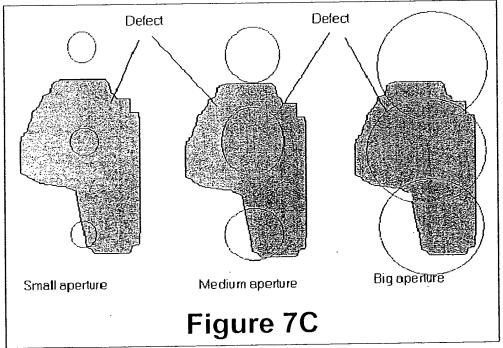
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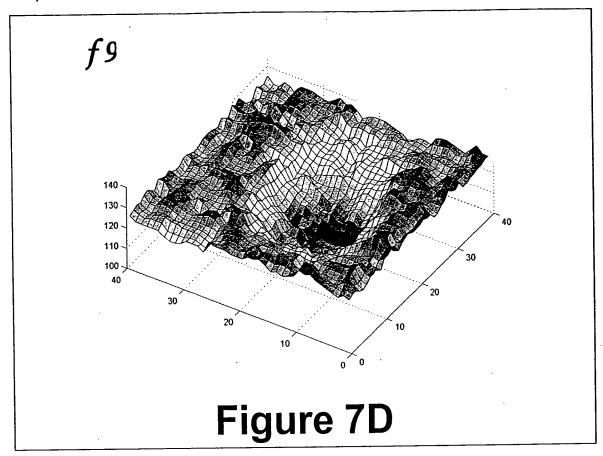


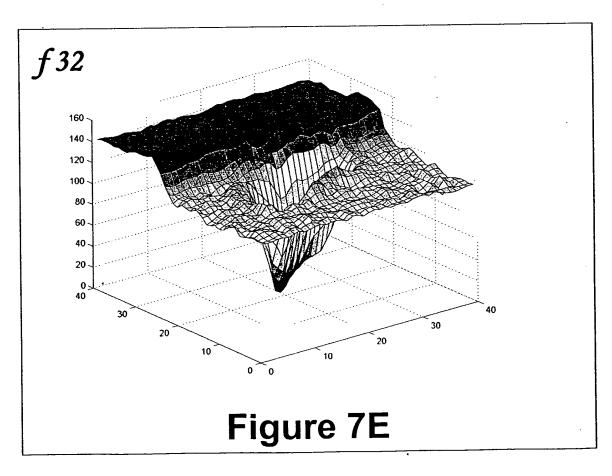
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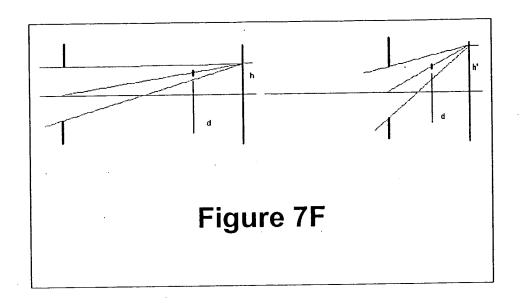


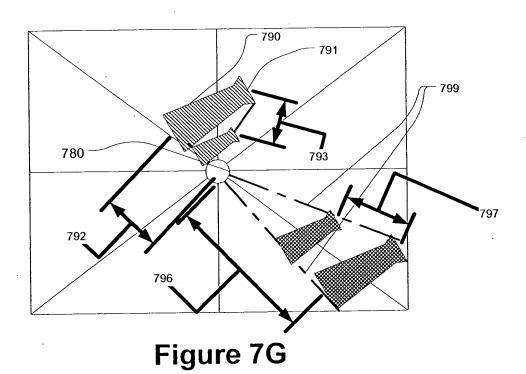
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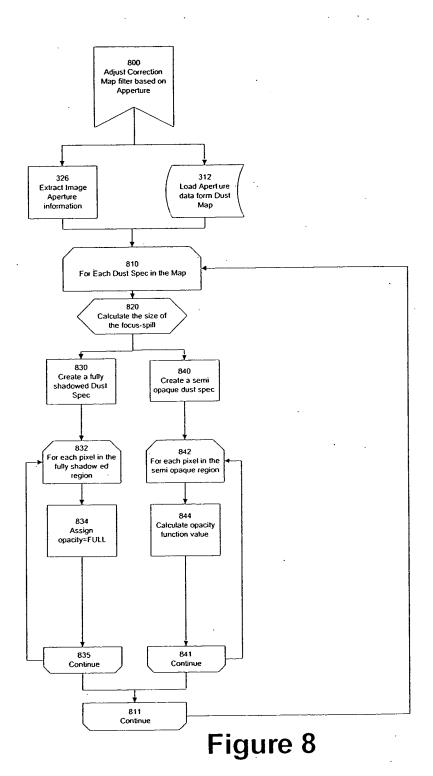


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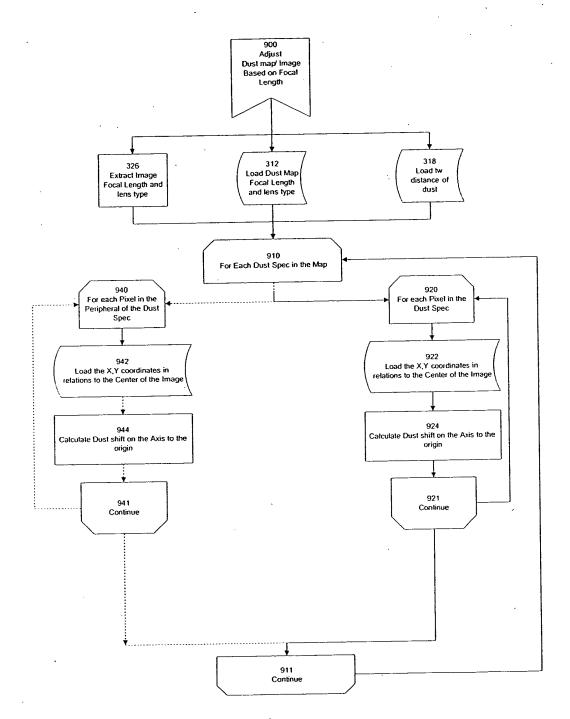


Figure 9

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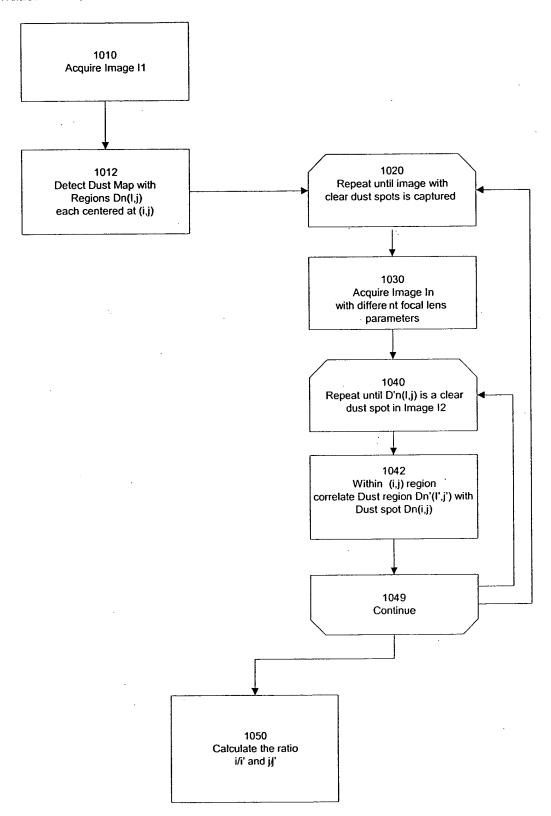
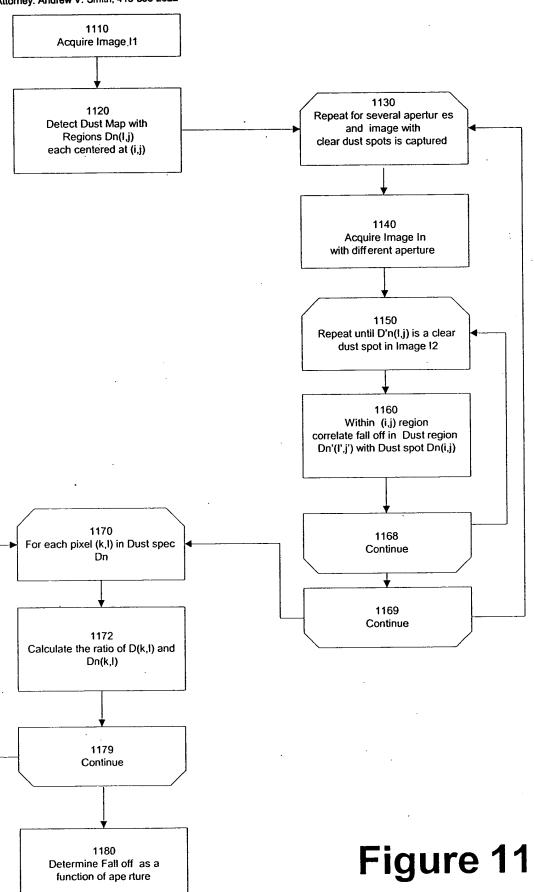


Figure 10

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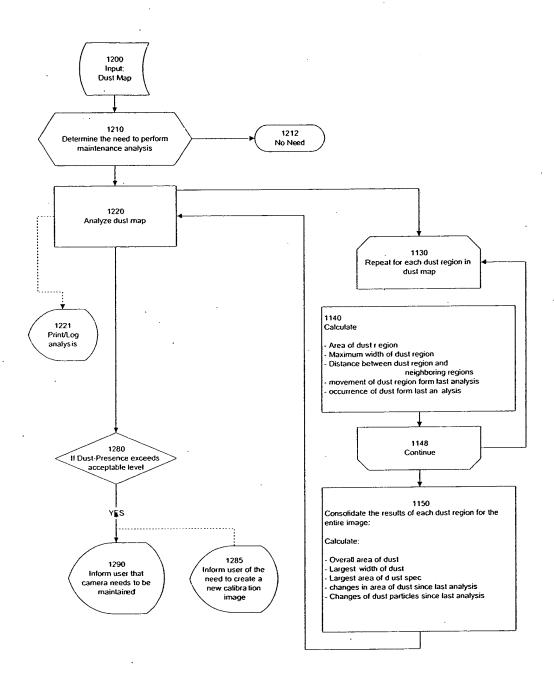


Figure 12